Important Safety/Installation/Operating Instructions
Scissor Lift SL Video Projector Lift by Draper

U.S. Patent Number D395,909

Save These Instructions

⚠Caution:

IMPORTANT SAFETY INSTRUCTIONS

Read all instructions completely before proceeding.

⚠DANGER: To reduce risk of shock:

① Always disconnect power from lift before cleaning.

⚠WARNING–To reduce risk of burns, fires, electric shock or injuries to persons:

② Disconnect power from lift before putting on or taking off parts.

③ Use this lift only for its intended use as described in these instructions. Do not use attachments not recommended by the manufacturer.

④ Never operate this lift if it has a damaged cord or plug. If it is not working properly, call your dealer or the manufacturer for assistance/repair.

⑤ Keep cords away from heated surfaces.

⑥ Never operate lift with air opening blocked. Keep the air openings free of lint, hair, and the like.

⑦ Never drop or insert any object into any opening.

⑧ Do not use outdoors.

⑨ Route cords and cables as shown in the instructions.

⑩ ⚠***WARNING: Risk of Electric Shock—connect this product to a properly grounded electrical supply.***

IMPORTANT INSTALLATION/OPERATING INSTRUCTIONS

⚠***WARNING: To prevent injury, this apparatus must be securely attached to the building structure in accordance with the instructions.***

Caution: Do not operate Scissor Lift SL without a minimum of 15 lbs. of weight attached to the pan. Operating without weight may cause cables to unspool.

⑪ Test lift prior to installation. ***Please Note: Packaging must be removed from lift before testing.***

⑫ Follow instructions carefully. Installation contrary to instructions invalidates warranty.

⑬ Do not obstruct operation of Scissor Lift SL with fingers or any object. Serious injury or damage could result.

⑭ Lift is intended for use with product weighing not more than 100 pounds.

⑮ Scissor Lift SL is designed to accommodate ceiling suspended equipment. **Equipment should not be allowed to rest on optional ceiling closure during operation (refer to section titled "Installing Projector").**

⑯ Entire bottom of unit must be unobstructed to permit proper operation. Sufficient clearance must be allowed below projector or optional ceiling closure: 4' for Model SL4, 10' for Model SL10, etc.

⑰ Unit must be installed level (use a carpenter's level).

⑱ Unit operates on 115V AC 60 Hz. current. 9.06 amps current draw (2.06 amps for lift, 7 amps for outlet).

⑲ Verify the show position when testing lift. Make required changes by referring to adjustment instructions on page 4 of this document.

⑳ The maintenance/service factory limit setting must not be adjusted to a lower position than the preset factory limit setting. In addition, Draper does not recommend setting show position at the maintenance/service position—for example, if you wish to have 8' show position, order a lift with at least a 10' maintenance position.

㉑ **When the Scissor Lift SL is to be installed in "other space used for environmental air" the optional environmental air space housing must be installed per instructions to isolate the lift from the "other space used for environmental air."**

㉒ When Scissor Lift SL is **NOT** installed in environmental air space housing and optional ceiling closure, the ***ALTERNATE*** wiring for up limit switch may be used *(see Alternate Wiring schematic on page 5).*

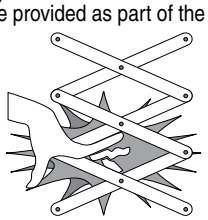
⚠***CAUTION: Before servicing unit, disconnect hardwired control and any remote control.***

Note: *Unit has been thoroughly inspected and tested at factory and found to be operating properly prior to shipment.*

Electrical Connections

Unit operates on 115V AC, 60 Hz. current. 9.06 amps current draw (2.06 amps for lift, 7 amps for outlet). Opening the electrical box exposes terminals for field connections. Unit is shipped with internal wiring complete.Wire to connect unit to power supply should be furnished by installer. Connections should be made in accordance with wiring diagram, and wiring should comply with national and local electrical codes. An appropriate disconnect device shall be provided as part of the building installation. All operating switches should be "off" before power is connected.

⚠ Caution: Beware of pinch points



⚠Caution: Make sure electrical supply has been disconnected before attempting to connect Scissor Lift to electricity.

Scissor Lift should be operated and checked prior to installing projector and/or optional ceiling closure. Low Voltage Control Switch shown below comes with 75' of non-plenum rated cable and should be plugged in to Control Panel on top frame of lift for control of the "Up" and "Show" positions. Momentary Key Switch shown below comes with 75' of cable and should be plugged in to Control Panel on top frame of lift for control of the "Service" position.

Planning

① Based on screen location and projector specifications, determine proper position for projector installation.

② Confirm that there is adequate space for installation and operation. Minimum clearance above ceiling level varies according to Scissor Lift model, plus height of projector, optional mounting bracket, optional ceiling closure, and optional Environmental Air Space Housing.

③ Arrange to provide service access to the unit.

④ Maximum lifting capacity is 100 lbs.

As Soon As Scissor Lift Arrives

① Open carton and inspect for damage.

② Locate the following parts:
A. The unit itself
B. Controls
C. Optional equipment: Environmental Air Space Housing, Universal Projector Mount, closure panel or ceiling finish kit (all ship in separate cartons).

③ Test lift prior to installation. ***Please Note: Packaging must be removed from lift before testing.***

Operation

Before operating or testing the unit, make sure the packaging has been removed from the unit. Remove the corrugated block from the cardboard sleeve (bottom-most packaging material), then collapse the sleeve and remove it, along with the rest of the packaging. Next, operate the lift in the "up" direction, so the lift's control encoder will recognize it's "home" location. Until you do this, the Down function will not work. ***You must also do this if the Scissor Lift ever loses or is disconnected from the power.***

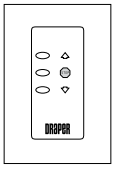
When unit is first operated, be cautious! If unit fails to operate properly, press "off" and recheck electrical connections before proceeding. Cycle unit down and up several times to confirm satisfactory operation.

⚠***Caution: Do not pull on or touch safety belt when unit is in motion. If belt locks, the cables will unspool.***

⚠***Caution: Obstructing bottom pan may cause cables to unspool.***

⚠***Caution: Do not operate Scissor Lift SL without a minimum of 15 lbs. of weight attached to the pan. Operating without weight may cause cables to unspool.***

LVC-S
Up & Show



SP-KSM
Service

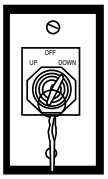


Figure 1

Standard Single Station Low Voltage Control (See Fig. 1)—One three-button switch with "up", "down", and "off" buttons. Lift starts up or down when appropriate button is pressed, and may be stopped by pressing "off" button. Factory set limit switches stop lift automatically when projector is in "show" position. One momentary key switch lowers lift from "show" to "service" position.

Optional Multiple Station Control—Optional, moves lift from "stored" to "show" position only. Each switching station has a three-button switch with "up", "down", and "off" buttons. Lift starts up or down when appropriate button is pressed, and may be stopped by pressing "off" button. Factory set limit switches stop lift automatically when projector is in "show" position.

Optional Key Operated Switch—If ordered, the standard LVC-S can be replaced with a second single station, momentary key-operated three position (up/off/down) switch. Multiple Station Control required for this option. Moves lift from "stored" to "show" position only.

Optional Infrared or Radio Frequency Remote Control—If ordered, a three-button transmitter is provided, with "up", "down", and "stop" buttons. Unit starts up or down when appropriate button is pressed, and may be stopped by pressing "off" button. Factory set limit switches stop unit automatically when projector is in "show" position. Only controls "show" and "stored" positions.

Optional RS232 Control—For Serial communication an R2D7 Serial Communications Interface is optionally available.

Low Voltage Trigger—Input provided for Low Voltage Trigger from projector (see diagram on page 4).

Scissor Lift SL is approved to **UL 2442** and **CSA C22.2 No. 60065-03**.

Please Note: Scissor Lift SL must be installed in accordance with the requirements of the Local Building Codes, the Canadian Electrical Code (CEC), CAN/CSA C22.1 and the National Electric Code (NEC), NFPA 70, as required. An appropriate disconnect device shall be provided as part of the building installation.

If you encounter any difficulties installing or servicing your Scissor Lift SL, call your dealer or Draper, Inc. in Spiceland, Indiana, 765-987-7999, or fax 765-987-7142.

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Hanging Unit

Please note: If using Environmental Air Space Housing option, go to Environmental Air Space Housing instructions on page 3.

The Scissor Lift may be installed in a variety of ways; recessed above the ceiling, or suspended below the ceiling. The lift should be supported by four 3/8" threaded mounting rods or bolts with locking nuts. If ceiling recessed, the entire unit (including the projector) should set approximately 1½" above the finished ceiling in its "stored" position. The threaded rods should pass through the corner mounting flanges and be secured by nuts above and below. The unit should then be guy wired or blocked to prevent swinging. All installations should observe the following guidelines:

① If installing above a hard ceiling, optional Draper Access Panels are available to allow access to the unit.
② Installer must ensure that all fasteners and supports are of adequate strength to securely support Scissor Lift and projector.
③ Fastening methods must be suitable for mounting surface, and securely anchored so that vibration or abusive pulling on unit will not weaken installation.
④ Unit should be level, with weight shared more or less equally by all four threaded mounting rods.
⑤ Bottom of unit must be unobstructed after installation. Sufficient clearance must be allowed below projector or optional ceiling closure.
⑥ Unit must be secured independent from suspended ceiling and do not use unit to support adjacent ceiling, light fixtures, etc.
⑦ Unit to be installed so when lowered to its lowest point, it is a minimum of 8 feet (2.44 m) above the floor.
⑧ Do not complete the ceiling below unit until electrical connections have been completed and unit has been operated successfully.
⑨ We recommend that safety cables be attached to the Scissor Lift SL for added security (a sound installation practice with overhead equipment).
⑩ **When the Scissor Lift SL is to be installed in "other space used for environmental air" the optional Environmental Air Space Housing must be installed per instructions to isolate the lift from the "other space used for environmental air."**
⑪ When Scissor Lift SL is **NOT** installed in environmental air space housing and optional ceiling closure, the ***ALTERNATE*** wiring for 'UP' limit switch may be used. Disconnect both **BLACK (BK)** wires from 'UP' limit switch and quick connect them together usingthe provided jumper cable *(see Alternate Wiring schematic on page 5).*

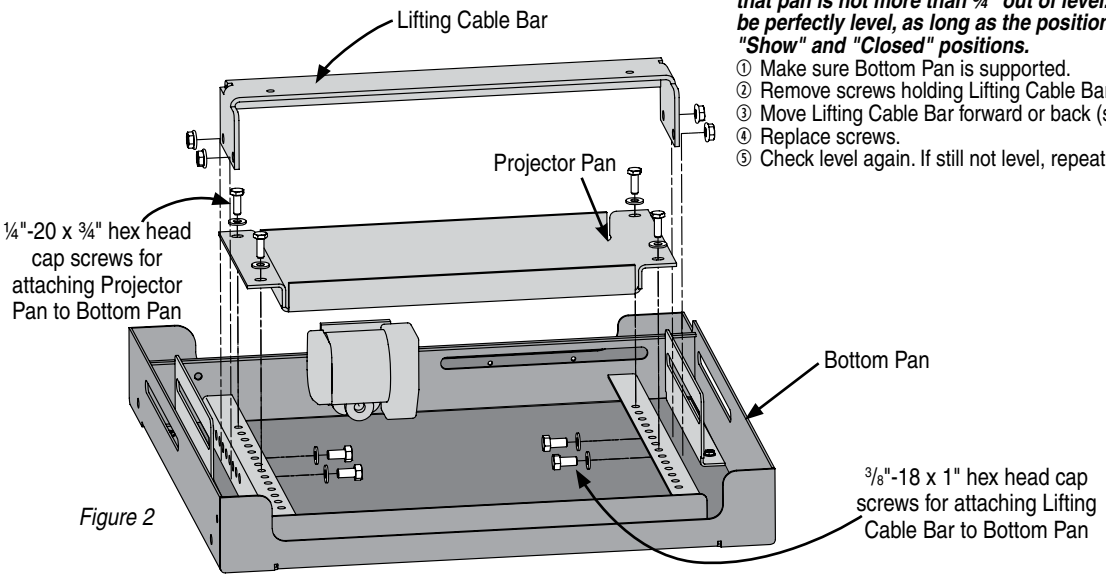

Lifting Cable Bar
Projector Pan
¼"-20 x ¾" hex head cap screws for attaching Projector Pan to Bottom Pan
Bottom Pan
3/8"-18 x 1" hex head cap screws for attaching Lifting Cable Bar to Bottom Pan

Figure 2

Installing Projector

Generally, the video projector should be suspended from the Projector Pan according to projector manufacturer's instructions and recommended standard ceiling mounting hardware. Projector should be bolted to Projector Pan as in a normal ceiling mounting. Equipment should not be allowed to rest on optional ceiling closure during operation.

The Scissor Lift SL has a grounded 115V AC, 60 Hz power cord for projector power supply. The power cord is laced down the back scissor and is "hot" at all times.

Control cables should be laced through our Cable Management System on rear scissor mechanism only. Route the cables and attach with plastic wire ties similar to factory installed power cable. Make sure to use flexible cables. Plenum rated cables are typically too stiff and should not be used. Installer is responsible for ensuring cables do not stretch, kink, or interfere with the scissor mechanism as the unit raises and lowers. This will ensure that cords do not become tangled and damaged during Scissor Lift SL operation.

Unit and projection system should be operated, checked and adjusted as necessary at this time.

NOTE: *Immediately upon completion of the surrounding ceiling, units should be operated to confirm that optional ceiling closure panel stops just short of touching ceiling in closed position.*

⚠***Warning:*** *Keep fingers and other objects away from automatic ceiling closure and scissor mechanisms when unit is operating. Serious injury or damage could result.*

Adjusting for Level or Center of Gravity

Preferred Method—Adjusting Projector Pan

The Projector Pan can be moved forward or back.

① ***Make sure Bottom Pan is supported.***
② Remove the Lifting Cable Bar (see Fig. 2).
③ Remove screws holding Projector Pan on Bottom Pan (see Fig. 2).
④ Move Bottom Pan forward or back.
⑤ Replace screws.
⑥ Replace Lifting Cable Bar.

Secondary Method—Adjusting Lifting Cable Bar (if above does not work)

Run the unit to its "Service" position and make sure pan is level. ***Try and set so that pan is not more than ¾" out of level. However, the pan does not have to be perfectly level, as long as the positioning is consistent and repeatable in "Show" and "Closed" positions.***

① Make sure Bottom Pan is supported.
② Remove screws holding Lifting Cable Bar to the Bottom Pan (see Fig. 2).
③ Move Lifting Cable Bar forward or back (see Fig. 2).
④ Replace screws.
⑤ Check level again. If still not level, repeat.

Installing Optional Universal Projector Mount

If you ordered the unit with optional Universal Projector Mount pre-installed, disregard these instructions.

If you did not order the mount pre-installed, you will need to install a new Projector Pan, which includes the Universal Projector Mount's rectangular plate.

The optional Universal Projector Mount will hold up to 26 lbs.

① Lower unit until the Bottom Pan is resting on a tabletop or other stable and sturdy surface.
② Remove Lifting Cable Bar from Bottom Pan (see Fig. 2).
③ Remove bolts holding Projector Pan to Bottom Pan (see Fig. 2).
④ Remove Projector Pan and set aside.
⑤ Place new Projector Pan with Universal Mount into place.
⑥ Re-attach Projector Pan to Bottom Pan.
⑦ Re-attach Lifting Cable Bar to Bottom Pan.

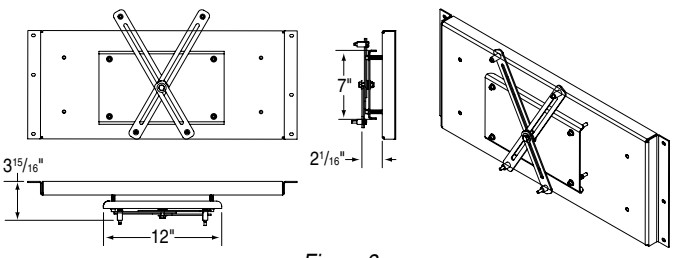


Figure 3

Installing Projector Using Universal Projector Mount

The Universal Projector Mount includes:
-2 x long arms
-4 x short arms
-4 x M3, 4 x M4, 4 x M5 and 4 x M6 mounting bolts (30mm in length)
-4 spacers (½" [13 mm], 5/8" [16 mm], ¾" [19 mm], 7/8" [22 mm])

① Determine which size mounting bolts suit your projector, and set others aside. They are no longer required. If your projector has only three mounting holes, set aside one of the mounting arms (see Fig. 3).
② Attach the appropriate mounting arms to the rectangular plate via center bolt. Spread out the arms so each end is over one of the mounting holes.
③ Connect projector mounting arms.
④ Tighten the mounting bolts.
⑤ Use the ¼" (6.35 mm)-20 bolts and springs which hold the rectangular plate to the bottom pan to adjust roll and tilt (the springs will ensure that the projector is held still during motion). The center 5/16" (8 mm) bolt provides Yaw adjustment (see Fig. 4).

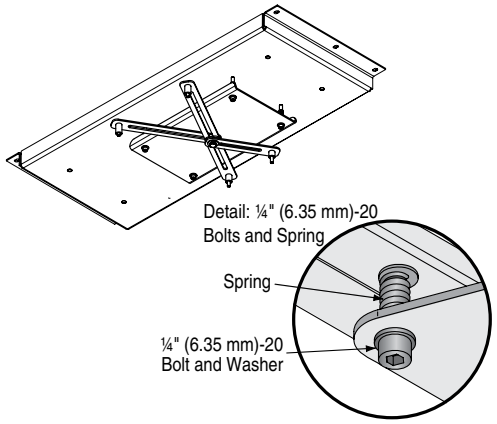


Figure 4

Scissor Lift SL Dimensions

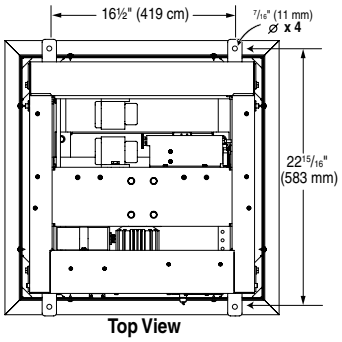
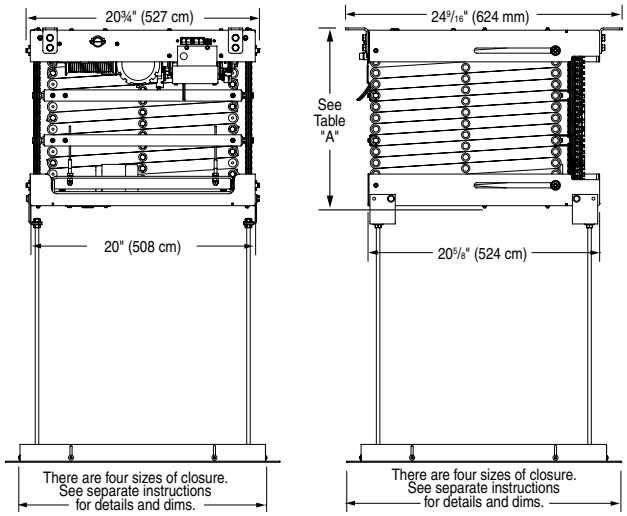


Table A

Model	Closed Height	Extended Height
SL4	8"	4'
SL6	10"	6'
SL8	12"	8'
SL10	14"	10'
SL12	16"	12'



Installing Optional Environmental Air Space Housing

The Environmental Air Space Housing is shipped in pieces, and must be assembled by the installer. The height of the Environmental Air Space Housing is set by drilling out the knockouts at the desired locations then using screws to connect side panels. It is recommended that an access panel be installed in the ceiling to allow future access. The optional environmental air space housing must be installed to isolate the lift from the "other space used for environmental air."

Includes trim ring for ceiling opening.
See installation instructions included with Environmental Air Space Housing.

Please Note: When using the Environmental Air Space House "SL" size, the mounting brackets attached to the top four corners of the Scissor Lift SL must be removed, and replaced with brackets which are shipped with the Environmental Air Space Housing (see Fig. 5).

Please Note: The factory wiring of 'UP' Limit Switch MUST ALWAYS be used when SL is installed in Environmental Air Space Housing and optional ceiling closure.

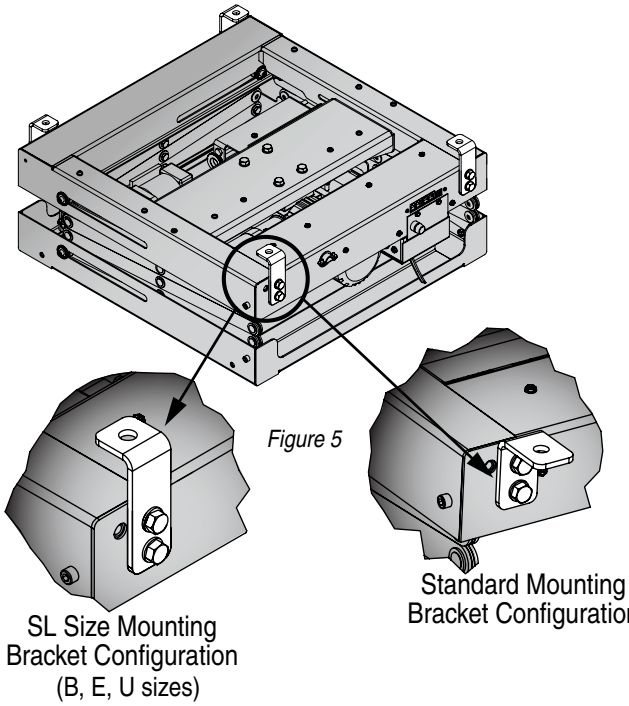


Figure 5

Installing Optional Ceiling Closure

If your Scissor Lift SL is equipped with optional ceiling closure, it can be used as is, or in conjunction with a square of existing ceiling tile. See installation instructions included with ceiling closure.

Installing Optional Ceiling Trim Kit

The Scissor Lift SL is available with a ceiling trim kit, which consists of the lower section of the Environmental Air Space Housing and the optional closure panel. See installation instructions included with Ceiling Trim Kit.

Scissor Lift SL Inspection and Maintenance

Draper recommends inspecting the Scissor Lift SL at least annually or every 300 cycles—whichever comes first.

A recommended maintenance schedule includes:
-Cables: Check for fraying
-Fasteners along scissor arm assemblies: Make sure they are not loose. If any are loose, hand tighten the nuts. *(Please Note: there is no need to tighten nut in the top scissor which slides back and forth in the side slot in the lift. Tightening this fasteners assembly will cause the unit to lock up and lead to damage to the unit.)*
-Closure: Make sure threaded rod remains seated firmly in the closure panel corners, and that the nuts remain tight. If they are loose, tighten them.

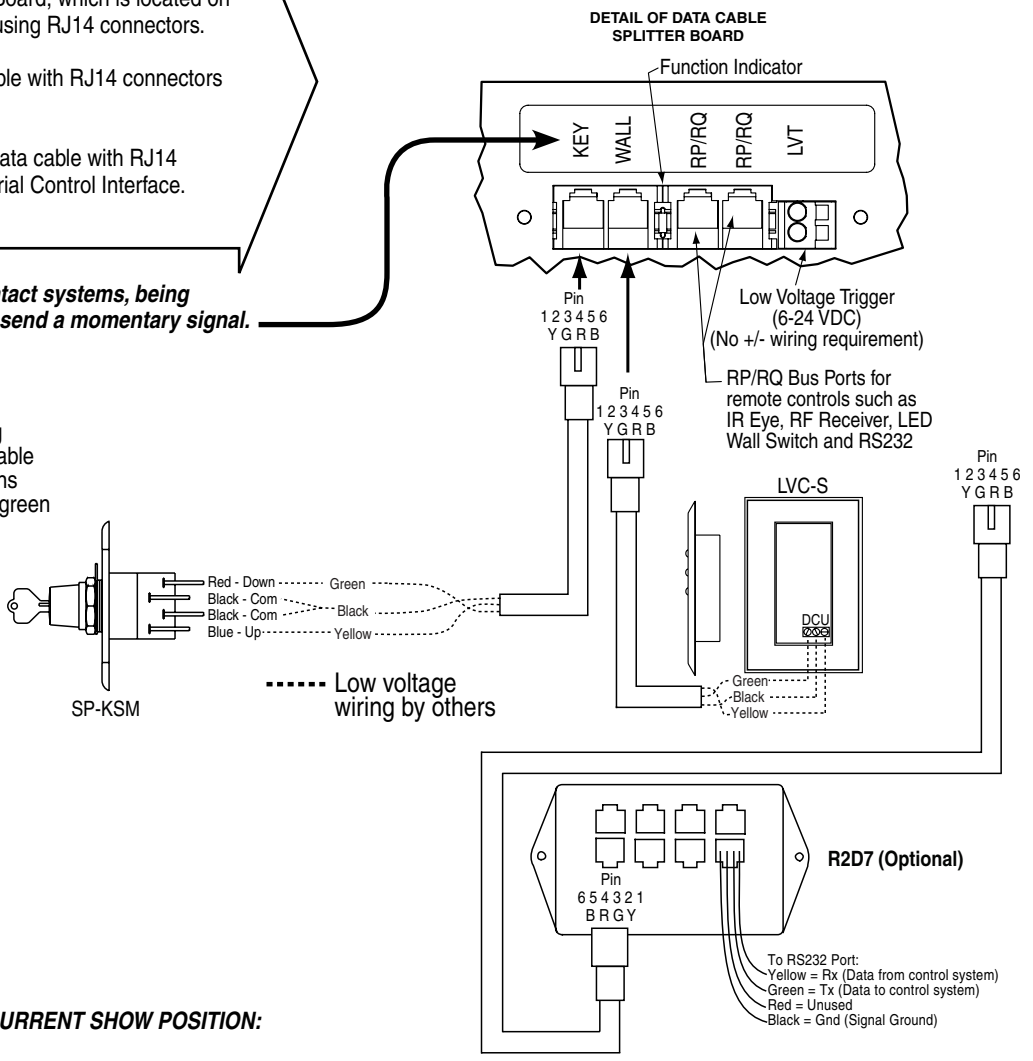
Connecting Controls to Data Cable Splitter Board

Controls plug into the Data Cable Splitter Board, which is located on the Top Frame on the front side of the lift, using RJ14 connectors.

For IR or RF Remote Control, use data cable with RJ14 connectors on both ends.

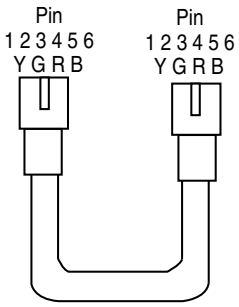
For serial control of "Show" position, use data cable with RJ14 connectors on both ends and an R2D7 Serial Control Interface. Plug into the "RP/RQ" input.

Any control, including automated dry contact systems, being connected to the wall switch input MUST send a momentary signal.



Please Note:

Data cable connections must be made using ***electrically straight*** 4-conductor modular cable (RJ14). If making your own cables, this means colors do not cross over: blue leads to blue, green to green, etc. (see diagram below).



CLEARING THE SHOW POSITION AT CURRENT SHOW POSITION:

① Move lift to the show position.
② While lift is at the show position press and hold the Key Up toggle switch and release once the Lift begins moving upward.
③ The show position is now cleared and ready for a new show position to be set.

CLEARING THE SHOW POSITION AT THE MAINTENANCE POSITION:

① Move lift to the maintenance position.
② While lift is at the maintenance position press and hold the Key Down toggle switch and release once the Lift begins moving upward.
③ The show position is now cleared and ready for a new show position to be set.

PLEASE NOTE: At this point the Key Switch will not operate until the new "Show Position" has been set. Also the 3-Button Wall Switch changes into a maintain, push and hold type button, for continuous movement. This allows for easy setting of new "Show Position")

PROCEDURE FOR SETTING SHOW POSITION:

① Now that the show position has been cleared, use wall switch up and down buttons to get lift into desired show position.
② While lift is at desired show position, press and hold the Key Down toggle switch until lift begins to move upward. Lift will begin a calibration cycle where it will move upward for two seconds, stop then move down for one second and then the Lift will return to the desired show position.

Optional Delay Feature

① When the Optional Delay Feature is installed the Delay Switch must be in the "Delay On" position for normal operation.
② If the Optional Delay Feature is installed and the "Show Position" requires adjusting, then the "Delay Switch" must be switched to **OFF** while adjusting the show position.

PLEASE NOTE: If the Scissor Lift loses power, the* DOWN *function will not work until you operate the lift in the* UP *direction using the wall switch. This allows the lift's control encoder to recognize it's "home" location.

⚠ ***CAUTION:*** *Be sure all switches are in* **OFF** *position before adjusting limit switch. Always be prepared to shut lift off manually when new adjustment is being tested. Please refer to wiring diagram.*

Adjusting Limit Switches

PLEASE NOTE:

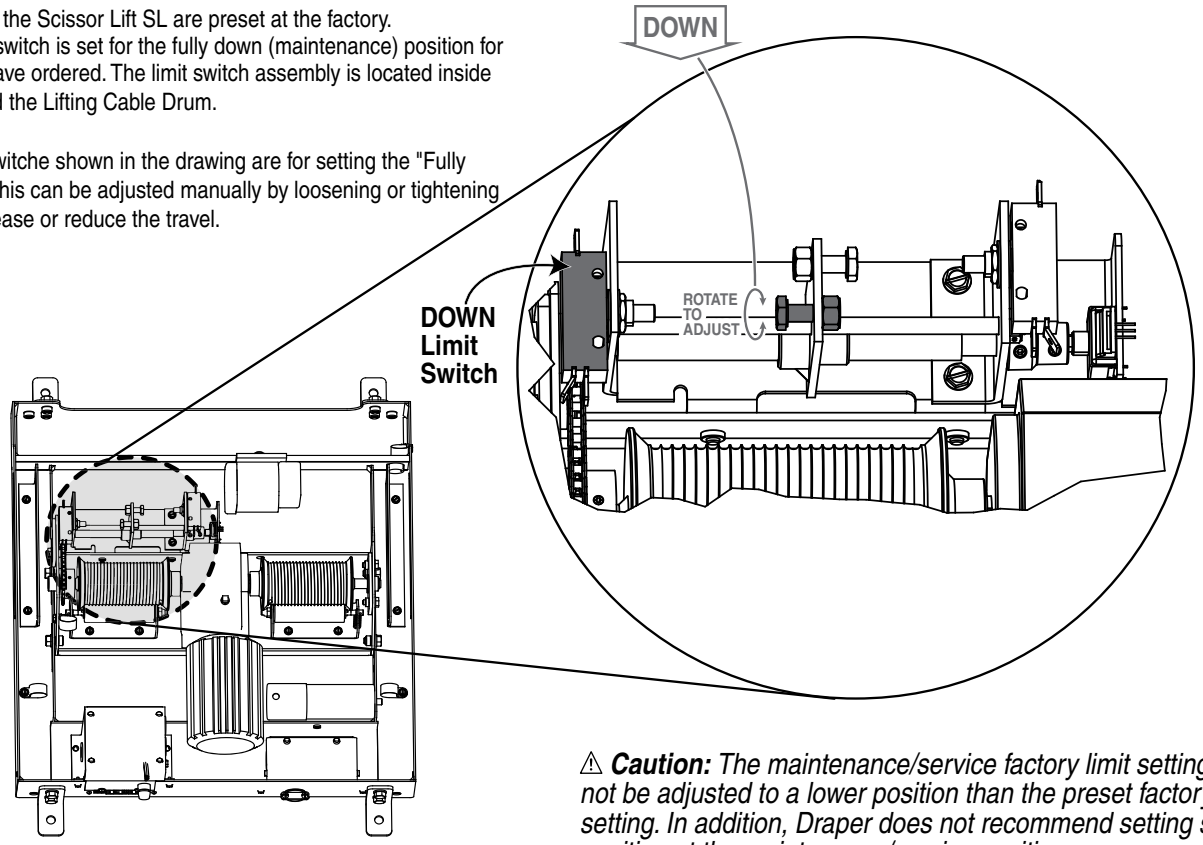
Changing the fully open or fully closed position will reset the electronic controls and cuase the lift to operate improperly. **Please call Draper before attempting these adjustments.**

Scissor Lift SL by Draper

Adjusting FULLY DOWN position

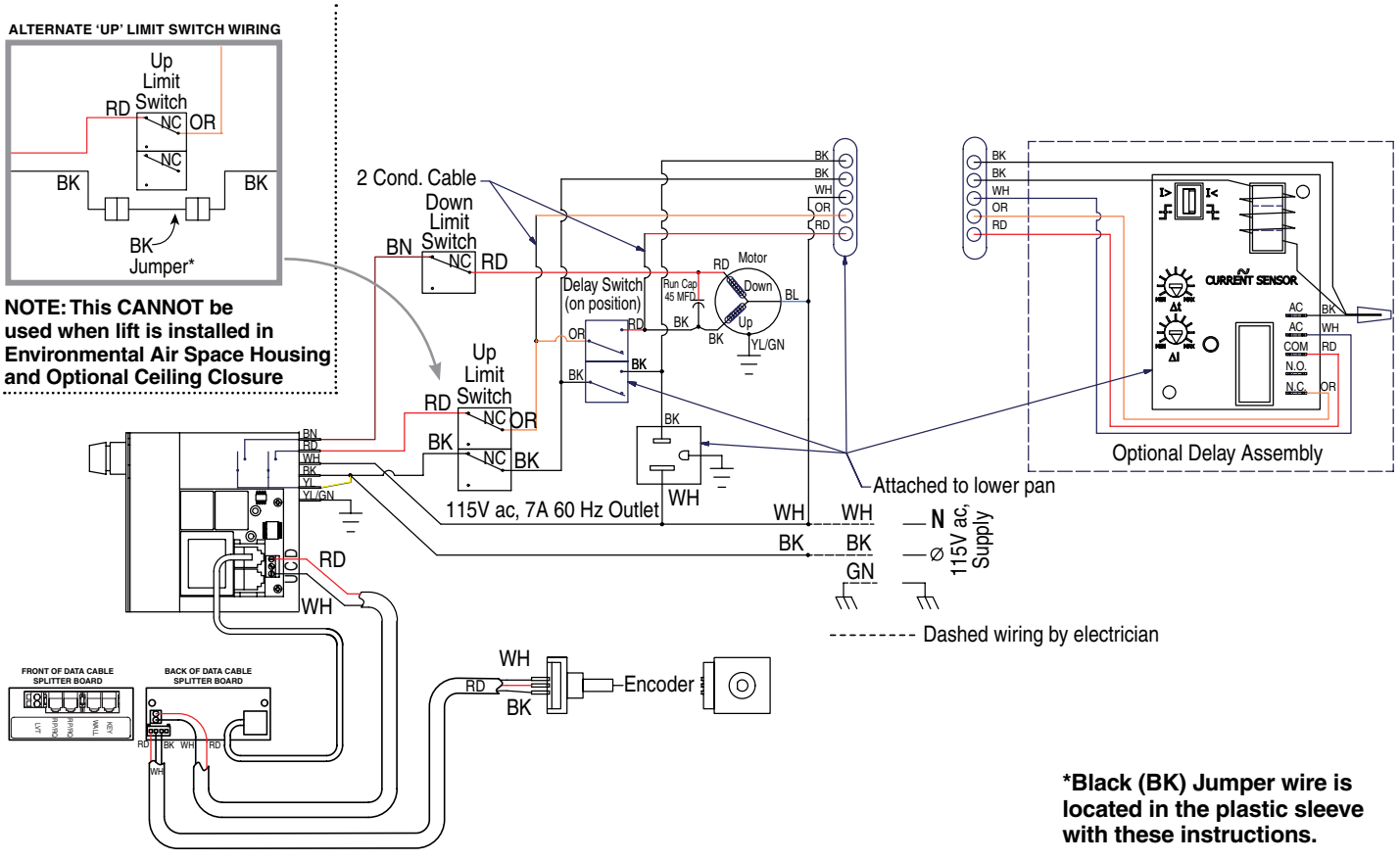
Limit switches for the Scissor Lift SL are preset at the factory. The **DOWN** limit switch is set for the fully down (maintenance) position for the size lift you have ordered. The limit switch assembly is located inside the lift and behind the Lifting Cable Drum.

The Down limit switche shown in the drawing are for setting the "Fully Down" position. This can be adjusted manually by loosening or tightening the screw to increase or reduce the travel.



⚠ ***Caution:*** *The maintenance/service factory limit setting must not be adjusted to a lower position than the preset factory limit setting. In addition, Draper does not recommend setting show position at the maintenance/service position.*

Wiring Schematic



***Black (BK) Jumper wire is located in the plastic sleeve with these instructions.**